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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/159,386	09/23/1998	MASAHIRO MAKI	50023-097	5068

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EXAMINER
HA, DAC V

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 01/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/159,386	Applicant(s) MAKI ET AL.	
	Examiner Dac V. Ha	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-10 and 14-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-10 and 14-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This is in response to the amendment filed on 11/15/01.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims1, 2, 4, 6-10, 14-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashino et al. (US 5,682,376) in view of Hyll (US 6,005,893).

Regarding claim 1, Hayashino et al. disclose a Method Of Transmitting Orthogonal Frequency Division Multiplex Signal, And Transmitter And Receiver Employed Therefor which teaches all the claimed subject matter "a sending ... carrier signals" in Figure 1, element 1; Column 7, lines 45-61; Abstract. Hayashino et al. teach almost all the claimed subject matter in claim 1 as stated above, except for the claimed subject matter "a selection ... receiver side." However, the attention is now directed to Hyll. Hyll discloses a Reduced Complexity Bit Allocation To Subchannels In A Multi-Carrier, High Speed Data Transmission System which suggests the teaching of the claimed subject matter "wherein ... receiver side" as follow. Hyll utilizes a multi-carrier system for data transmission. More particularly, Hyll optimizes the use of the subchannel in accordance to the channel characteristic (i.e. based on SNR). The channel characteristic could have been determined at anywhere between the two transmission ends (Abstract; Figure 10; Column 3, lines 43-58.)

Therefore, it would have bee obvious to a person of ordinary skill in the art at the time of the invention to incorporate the concept of controlling the transmitting and receiving of the multicarrier based on the channel characteristic taught by Hyll into Hayashino et al. to optimize the utilization of the multicarrier signals.

Regarding claim 2, Hayashino et al. further teach the claimed subject matter "a carrier ... transmission line" in Figure 1, element 1; Column 7, lines 45-66.

Regarding claim 4, Hayashino et al. further suggest the teaching of the claimed subject matter "there is ... generating means" in Figure 1, elements 15-19; Column 7, line 151 to Column 10, line 10.

Regarding claim 6, Hayashino et al. further teach the claimed subject matter "wherein ... carrier signals" in Column 1, lines 55-65, where the number of carriers is selectively generated depending on the desired requirement.

Regarding claim 7, Hyll further suggests the teaching of the claimed subject matter "wherein ... generating means" in Column 3, lines 42-58.

Regarding claim 8, Hyll further suggests the teaching of the claimed subject matter "wherein ... carrier signals" in Column 3, lines 42-58; Column 5, lines 13-38.

Regarding claim 10, Hyll further suggests the teaching of the claimed subject matter "an encoder ... said filter" if Figure 4, element 30, Column 2, line 34 to Column 3, line 58.

Regarding claim 14, see claim 3 above and further in Hayashino et al., Figure 2, element 2.

Regarding claims 15, 18, see claim 3 above.

Regarding claim 16, see claim 6 above.

Regarding claim 17, see claim 7 above.

Regarding claim 19, Hyll further suggest the teaching of the claimed subject matter "wherein ... received" is known in the art in Column 1, lines 26-28.

Regarding claim 20, in Hyll's reference, a channel characteristic is determined based on a SNR. However, one skilled in the art would have realized that when a signal propagates through a channel and gets affected by the channel, many parameters of the signal would be affected. Hyll utilized SNR to determined the channel characteristic only as an option. One skilled in the art would have known that other signal parameter could have been utilized to enhance the determination of the channel, thus, better controlling of the signal detection. Therefore, the claimed subject matter "wherein ... reference phase" would have been obvious to one skilled in the art.

Regarding claim 21, see explanation in claim 20 above.

Regarding claim 25, see claim 10 above.

Regarding claim 24, the claimed subject matter "wherein ... value range" would have been obvious to one skilled in the art if other parameter, i.e. phase information, is utilized.

Regarding claims 22, 23, see claims 20 & 24 above.

Regarding claim 26, see claim 24 above.

Regarding claim 27, see claims 25 & 9 above.

Regarding claim 28, see claims 1 & 14 above.

Regarding claim 29, see claims 10 & 14 above.

Regarding claims 30, 32, see claim 15 above.

Regarding claim 31, see claim 3 above.

Regarding claim 33, see claim 4 above.

Regarding claim 34, see claim 9 above.

Regarding claims 35, 38, see claim 8 above.

Regarding claims 36, 37, see claims 6, 7 above, respectively.

Regarding claim 39, see claim 19 above.

Regarding claims 40, 41, see claims 20, 21 above, respectively.

Regarding claims 42, 43, see claim 21 above.

Regarding claims 44, 45, see claim 24 above.

Regarding claim 46, see claim 25 above.

Regarding claim 47, see claims 20 & 46 above.

Regarding claim 48, see claim 9 above.

Response to Arguments

4. Applicant's arguments filed on 11/15/01 have been fully considered but they are not persuasive.

In the REMARK, page 10, applicants argue that "claim 1, as amended, describes ... time domain." The claimed invention calls for "converting an input signal into carrier signals." The OFDM, as disclosed in Hayashino et al. patent, also utilizes one input signal and the result before transmitting the signal to receiving side is a multi-carrier signal. That is the original data input is modulated on a plurality of carriers. Also, it is noticed that transmitting the same signal over different frequencies is a principle of

frequency diversity technique (see The Communications Handbook by Ferry D. Gibson 1996, page 216 for a definition.)

Further, in the REMARK, page 11, applicants argue "Claim 4 ... vice versa." The Hull patent in incorporated illustrate that "a selection control means" for adaptive controlling, for example, the bandwidth, would have been obvious to one skilled in the art. The subject matter that how many carrier would be utilized in each particular system, however, is a well known in multi-carrier (OFDM, DMT) transmission technique (see also Hayashino et al. patent, column 1, lines 58-60.)

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Communications Handbook, 1996, by Ferry D. Gibson, page 216.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 703-306-5536. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-6743 for regular communications and 703-308-6743 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-5500.

Dac V. Ha
Examiner
Art Unit 2634

DH
January 16, 2002

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600